ROANOKE

Stormwater Division
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1802 Courtland Road
Roanoke, Virginia 24012

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Virginia Department of Environmental Quality
Blue Ridge Regional DEQ Office
Attn: MS4 Permitting Division 3019
Peters Creek Road
Roanoke, VA 24019

September 30, 2017

Re: City of Roanoke MS4 Permit #VAR040004, Year Four (2017) Annual Report and MS4 Program Plan Update

To whom it may concern,

The City of Roanoke is pleased to submit our year four (2017) MS4 Annual Report and Program Plan Update (General Permit #VAR040004). Enclosed please find a USB drive with our annual report for the preceding permit year. The report is also located on the City's MS4 Webpage. The City has simplified the Annual Report text and also when applicable, has inserted the supporting PDF documentation after each minimum control measure section. Please note that some of the technology that we use for our stormdrain system management surpasses the ability to properly convey all information in a printable PDF format; therefore occasional hyperlinks have been included in the MS4 Annual Report.

The City of Roanoke remains committed to maintaining a comprehensive MS4 Program. In addition, we continue to work collaboratively with our neighboring MS4s and other partners to improve stormwater issue and regulation awareness throughout the Roanoke Valley and beyond. You're welcome to contact me should you have any questions or comments. Thank you for your time and consideration of our submission.

Sincerely,

Leigh Anne Weitzenfeld, MNR, ENV SP, CFM
Water Quality Administrator

Encl: 2017 MS4 Annual Report and Executive Certification

CITY OF ROANOKE, VIRGINIA

MS4 Permit Annual Report and Program Plan Update

Reporting Period
July 1, 2016 – June 30, 2017

Submitted to:

The Virginia Department of Environmental Quality

Blue Ridge Regional DEQ Office
MS4 Stormwater Permitting Division
3019 Peters Creek Road
Roanoke, VA 24019

Prepared by:

Stormwater Division

Public Works Service Center
1802 Courtland Rd. NE
Roanoke, VA 24012

ANNUAL REPORT AND PROGRAM PLAN UPDATE SECTIONS

City of Roanoke Permit Number VAR040004

This report consists of documentation of the City of Roanoke's compliance with the following six minimum control measures as required by the General Permit for Discharges of stormwater from small municipal separate storm sewer systems (MS4)

Report Contents

Modifications to Departmental Roles and Responsibilities

There are no new role modifications for permit year 2016-2017 and remain as outlined below:

Dwayne D'Ardenne – Overall Compliance Assurance; Stormwater Division Manager

Leigh Anne Weitzenfeld – Overall Program Plan Administration, MCMs#1, #2 and #6; Water Quality Administrator

Christopher Blakeman – MCM#3, MCM#6; Environmental Administrator

George Nevergold – MCM#4, MCM#5; Development Review Coordinator

Number of New MS4 Outfalls and Associated Acreage by HUC during Permit Year

No new outfalls were generated during the FY 2016-2017.

Signed Executive Certification Statement

Continued on the following page.

Certification Statement and Requirements

As required by 9VAC25-870-370 B, all reports required by state permits, and other information requested by the board shall be signed by a responsible official or by a duly authorized representative of that person. A responsible official is:

1. For a corporation: by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means: (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy-making or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided the manager is authorized to make management decisions that govern the operation of the regulated facility, including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long-term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for state permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;

2. For a partnership or sole proprietorship: by a general partner or the proprietor, respectively; or

3. For a municipality, state, federal, or other public agency: by either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a federal agency includes (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency.

Duly Authorized Representatives

A person is a duly authorized representative only if:

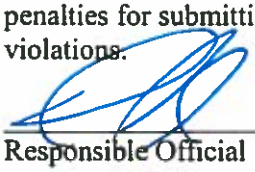
1. The authorization is made in writing by a person described above;

2. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. A duly authorized representative may thus be either a named individual or any individual occupying a named position; and

3. The written authorization is submitted to the department.

CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



Responsible Official Signature 9/09/17 Date

VAR040004, City of Roanoke, Virginia

Permit Number MS4 Name

Table of Contents

Special Conditions for Approved Total Maximum Daily Loads (TMDL) Other Than the Chesapeake Bay TMDL

Responsible Staff / Position: Leigh Anne Weitzenfeld, Water Quality Administrator (540) 853.5910

Description

An approved TMDL may allocate an applicable wasteload to a small MS4 that identifies a pollutant or pollutants for which additional stormwater controls are necessary for the surface waters to meet water quality standards. The MS4 operator shall address the pollutants in accordance with this special condition where the MS4 has been allocated a wasteload in an approved TMDL.

Annual Reporting Requirements

1. TMDL Action Plans

The City of Roanoke first submitted its Sediment and Bacteria TMDL Action Plan in 2015 and its PCB Action Plan in conjunction in 2016. TMDLs for these priority pollutants were approved prior to July 2008 and December 2009, respectively. The Action Plan describes the legal authorities, BMPs, education and training programs, and other initiatives the City will undertake to meet its waste load allocations and successfully delist the Roanoke River and its tributaries. Annual updates, necessary modifications and associated evaluation are noted in blue text for ease of regulatory review.

- City of Roanoke MS4 Program Plan, 2017 Revision
- City of Roanoke Sediment and Bacteria TMDL Action Plan
- City of Roanoke PCB TMDL Action Plan

Since the Stormwater Utility is still relatively new, the City is actively collecting data and resources for optimization of its program design, however there remains uncertainty in accurately estimating a timeframe for achieving the bacteria, sediment, and PCB WLAs. As new data is actively being collected through the various types water quality monitoring and during the creation of each tributary Watershed Master Plan we have begun to have enough information to begin targeting a WLA end date of 2072.

The table below provides a calculated estimation for installation of all WMP identified WQ projects used in projecting the WLA achievement date:

Budget FY2016-2017	YTD Expenditures FY2016-2017	Admin	CIP	Water Quality	Operations		
	$8,157,663.00	$737,260.47	$4,046,191.64	$1,695,280.28	$1,678,931.10	$4,111,471.36	FY17 Total Non-CIP Exp
	100%	9.0%	49.6%	20.8%	20.6%		
FY18 Estimates	$8,596,650.00	$773,698.50	$4,298,325.00	$1,762,313.25	$1,762,313.25		
		9.0%	50.0%	20.5%	20.5%		
9/29/2017 CIP Drainage Projects							
211 Projects	$139.2M		55.4	Years to complete @ 58.5% FY18 Estimated CIP Expenditures above			
9/29/2017 WMP Projects (4 To Date = Apx 1/3 area of City)							
97 Projects	$33.1M						
Est 221 Projects	Est $99.3M		55.7	Years to complete @ 41.5% FY18 Estimated CIP Expenditures above			
9/29/2017 Grand Total CIP Projects = $238.5M/$4.3M per year = Apx 55.5 years							

2. FY 2017 TMDL Facility Assessment

The City assessed all facilities in accordance with Section II.B.6.b. of the permit and identified several facilities that are high priority. At our Public Works Service Center, sediment pollution may occur as it is washed off of the pavement. To counteract this potential problem, the City mechanically sweeps these lots (moving all equipment and vehicles) twice a year. Bacterial pollution is possible on the Solid Waste Division "Ready Line" where all garbage and recycling collection trucks are stored overnight. To counteract this, the "Ready Line" is swept and cleaned every quarter, and the garbage trucks are fully washed at least weekly, and at times more often, especially during warm or hot weather. Absorbent pads have been added in the Readyline area to reduce fluid runoff. In addition, the Readyline SOP has been reviewed and updated to include monthly visual inspection and an additional visual inspection after a 1" rainfall event. Drop inlet cleaning will be conducted quarterly using an iterative adaptive approach for optimal inlet management. Additional areas identified during the June 2017 DEQ MS4 Audit are under review and solutions will be included in the forthcoming PWSC Master Plan update.

In addition to this identified facility, the City has several parks and green spaces where citizens play with their pets. In the permit year 2014-15, the City added two dog parks due to the potential for larger bacterial contamination loads. Thrasher Park has a fenced, leash-free acre sized yard. Thrasher Park straddles both Tinker Creek and Glade Creek watersheds but is geographically closer to Glade Creek. Highland Park also contains a fenced leash-free zone that is about an acre in size. Highland Park is in close proximity to the Roanoke River.

In an attempt to limit the pollution from pet waste, the City has installed 90 pet waste stations to date, which provide free bags for waste collection. Additional locations are added as needed and the Pet Waste Program is discussed in greater detail Under MCM #1 and MCM #6 of this report, in the Program Plan, and in the Sediment and Bacteria TMDL Action Plan.

A complete list of BMPs for these identified facilities can be found in the Program Plan, 2017 Revision including the specific Stormwater Pollution Prevention Plans, and other BMPs included in the TMDL Action Plan.

3. Monitoring Programs for TMDL Progress Assessment

The City has updated its Action Plan with completed action items during FY 2016-2017, documented successes, and included further development of program objectives.

In accordance with Section I.B.2.e, the City has included monitoring results as well as an initial analysis from bacteria monitoring conducted in FY16-17 for all of the City's watersheds. Please note that conclusions cannot be drawn successfully from such a small dataset however, there are several locations where high E.coli bacteria levels remain high and indicate periodic inputs due to heavy rainfall events or continual inputs from unidentified problems. As outlined in the Program Plan and Bacteria TMDL Action Plan, bacteria monitoring within the MS4 may be included during wet weather events in certain watersheds for the coming fiscal year. Over the next several years, the City will assess baseline data trends to predict an estimated end date.

Our liaison within the VT Department of Civil and Environmental Engineering coordinates with biologists at VT in the Department of Biological Sciences to complete benthic macroinvertebrate biannually within watersheds that have completed Watershed Master Plans. Due to personnel changes at Virginia Tech, we were unable to obtain benthic macroinvertebrate-based VSCI scores from fall 2016 and spring 2017 monitoring events in time for the Annual Report.

Results from the Roanoke Riverkeepers, the City's citizen science benthic macroinvertebrate monitoring program, will be included in the FY2017-18 Annual Report. As a result of the City's commitment to taking a watershed approach to resolving water quality impairments, the City has integrated action items into one unified Table from Table 12 of the Lick Run Watershed Master Plan and Table 5 from the Tinker Creek and Tributaries Watershed Master Plan. This table is included in this year's update of the Bacteria and Sediment Action Plan. The consolidated Table includes watershed indicators that will also serve as a measurement of reductions from key pollutants and enhancements of water quality in impaired watersheds.

The USGS monitoring station site is located in the Lick Run Watershed adjacent to the greenway below Washington Park near the intersection of 2nd St. NE and Patton Ave. NE. The goal of this monitoring program is characterize streamflow and sediment transport in Lick Run prior to, during, and after BMPs are implemented throughout the watershed. The monitoring objectives include: continual stream levels, water temperature, pH, conductivity, dissolved oxygen and turbidity. Data will also be used to determine annual loads of suspended sediment.

Water Quality Data through the USGS Program outlined in the Action Plan is available here:
http://waterdata.usgs.gov/va/nwis/inventory/?site_no=0205551460&agency_cd=USGS

Special Conditions for Approved TMDL other than the Chesapeake Bay TMDL

Supporting Documents:

- Bacteria Program and Monitoring Results – Interpretive Summary
- Bacteria Monitoring Data, FY 2017
- Bacteria Monitoring Watershed Graphs

MCM #1: Public Education and Outreach on Stormwater Impacts

Responsible Staff / Position: Leigh Anne Weitzenfeld, Water Quality Administrator (540) 853.5910

Description

The public education and outreach program should be designed with consideration of the following goals:

(1) Increasing target audience knowledge about the steps that can be taken to reduce stormwater pollution, placing priority on reducing impacts to impaired waters and other local water pollution concerns;
(2) Increasing target audience knowledge of hazards associated with illegal discharges and improper disposal of waste, including pertinent legal implications; and
(3) Implementing a diverse program with strategies that are targeted towards audiences most likely to have significant stormwater impacts.

In 2017, the City revised its MS4 Program Plan to more accurately reflect the program's growth and development since the Stormwater Utility was created. The MS4 Program Plan is available online and provides extensive detail on educational materials that are available and used as outreach tools. As per required under the 2013-2018 permit, the City has completed outfall mapping and SWPPP implementation.

Annual Reporting Requirements

1. Environmental Literacy, Contracted Support Services

The City of Roanoke has contracted with the Clean Valley Council (CVC) for the past several years to provide effective and efficient stormwater and water quality information and education throughout our region. The CVC's program offerings, as well as its classroom and field lessons reach a wide range of citizens and have a demonstrated track record of successfully fostering greater environmental literacy, awareness and stewardship.

In FY 2016-17, the contract was amended to include day-to-day oversight of the Roanoke Riverkeepers Citizen Science Water Monitoring Program. A copy of the City's contract with the CVC is attached for reference as needed.

2. FY 2017 Target Audience Identification and Estimation

The City, in collaboration with other area localities, identified sediment, bacteria, and nutrients as our three high-priority water quality issues at the beginning of this permit cycle. Target audiences were identified and their populations estimated based on various data sources. In addition, the City developed messages and outreach mechanisms, also in collaboration with other localities. An additional identified target audience for bacteria is septic system owners and was added to the targeted education and outreach matrix for FY17. In FY 2016, the City chose to add PCBs to the high priority water quality issues and have subsequently been working on outreach development for this target audience. All of this information, as well as a more in-depth description of our rationale, is included in the attached spreadsheet.

3. FY 2017 Education and Outreach Events

The City is committed to educating citizens on stormwater issues and best management practices through a variety of measures. The City participates in educational and outreach events to engage and educate citizens on a direct level to promote community involvement in creating a *Clean Water Legacy* in the upper Roanoke River watershed.

The City supports public education as the basis to increase stormwater awareness in promoting throughout and discussion, leading to behavior change and culture as it pertains to watershed health. The City provides resource materials, educational library resources, informative campaigns, and environmental literacy.

Please see attachment of City of Roanoke Outreach and Events Table and the Clean Valley Council's specific summaries for more in-depth details. Giveaway data can also be found on attached summary sheets.

Education and Outreach Events = 39,589 total citizens reached (40% of City of Roanoke citizens reached through combined outreach efforts from the City of Roanoke and Clean Valley Council)		
Clean Valley Council Summary = 23,155 citizens reached		
Educational Programming	Multijurisdictional Event Total	7,150 citizens reached
	City of Roanoke Events Total	7,218 students, 433 adults
Programming Types	Stream School	466 students, 237 adults
	General Environmental Literacy Programming	6,950 students, 383 adults
	Stormwater Educational Programs	268 students, 50 adults
City of Roanoke Summary = 16,434 citizens reached		
Educational Programming	Outreach Events	5,239 citizens reached
	Presentations	327 citizens reached
	Combined Social Media	10,868 citizens reached

City of Roanoke Stormwater Division Social Media Growth

Facebook Growth: (https://www.facebook.com/roanokestormwater/)
2014: 382 followers
2015: 1217 followers
2016: 1508 followers
2017:2182 followers

Twitter Growth: (https://twitter.com/RoanokeStormH2O)
2014: 272 followers
2015: 284 followers
2016: 604 followers
2017:1014 followers

Pinterest Growth: (https://www.pinterest.com/RoanokeStormH2O/)
2016: 84 followers
2017: 134 followers

Instagram Growth: (https://www.instagram.com/roanoke_stormwater/)
2017: 116 followers

Website Visits: (https://www.roanokeva.gov/Stormwater)
2016: 1,700 page views
2017: 2,630 page views

Next Door: (https://nextdoor.com/)
2017: 4792 followers

4. FY 2018 Planned Education and Outreach Events

The City's MS4 Program Plan, Bacteria and Sediment TMDL Action Plan, as well as the PCB TMDL Action Plan are the best repositories for charting future educational goals and plans. For the pollutant bacteria, the City will continue its pet waste reduction campaign by increasing awareness by placing signs downtown and develop new partnerships to increase efficiency in reaching and engaging the target audience of 7,131 registered dog owners. We will continue to create partnerships and expand our outreach campaign to ensure optimal function of existing septic fields, targeting 423 septic system owners. The city will also continue the bacteria monitoring program with the possible introduction of volunteers to help establish a baseline bacterial level and determine illicit bacteria sources. The City will also be partnering with organizations to address restaurant FOGs in the downtown area using multi-lingual educational and outreach material. The targeted audience for downtown restaurants is approximately 70 restaurants. The target audience for restaurants in the City of Roanoke is 513. The City will also increase the number of presentations given by visiting local organizations to find new ways in making a positive impact in creating a *Clean Water Legacy*.

For sediment, Stormwater is in the process of supporting stormwater infiltration via green infrastructure as part of forthcoming updates to the City's Stormwater Design Manual. Integration of the City's Action Plans with our developing watershed master plans will also aid in sediment reduction through addressing the causative factors. The Roanoke Riverkeepers, a citizen science water monitoring program, has been successful and will continue to grow. Additional projects that may be added to the program include clean water challenges, increasing the use of the Water Reporter App, and watershed memory interviews shared via a watershed story map. The City may include a "state of the waters" fact sheet in with a Riverkeeper newsletter. This could become an annual direct mailer to all Roanoke households.

Through a collaborative effort with Clean Valley Council and local civic groups, rainbarrel workshops will continue through our trained rainbarrel volunteers from the "Train-the-Trainer" Rainbarrel Initiative, which has currently 15 civic group trainers. Stormwater and Clean Valley Council plan to increase greater city school programs and initiatives such as expanding the stormdrain stenciling program and potentially inlet art at the schools.

Additionally, the City may collaborate with local partners to promote and emphasize "green" lawn care and educate city contractor organizations and local lawn care businesses to address the issue of mowed grass residue

on city sidewalks and streets as well as, fall leaves. These issues contribute to excessive nutrient loading into the MS4 and also to localized flooding due to clogging of the stormdrain system.

As part of the PCB TMDL Action Plan, the City will educate and train city staff on how to properly control, inspect and clean up or dispose of PCB materials at the Public Works Service Center. There are approximately 1,693 City of Roanoke Employees that will receive educational material and /or a presentation on the importance of understanding PCBs. The City will also direct mail PCB brochures to businesses, educating owners about PCBs and how to keep our waters safe and healthy for everyone.

MCM#1 Public Education and Outreach on Stormwater Impacts

Supporting Documents:

- CVC Contract, Outreach and Events FY 2016-2017
- City of Roanoke Outreach and Events FY 2016-2017

MCM #2: Public Involvement and Participation

Responsible Staff / Position: Leigh Anne Weitzenfeld, Water Quality Administrator (540) 853.5910

Description

In 2017, the City revised its MS4 Program Plan to more accurately reflect the program's growth and development since the Stormwater Utility was created. The MS4 Program Plan is available online and provides extensive detail on educational materials that are available and used as outreach tools.

The City has a strong commitment to honoring the public involvement permit requirement and increasing public participation in watershed events. The City supports public involvement as the foundation for increasing social capacity which may ultimately lead to behavioral and cultural change as it pertains to watershed health. The City actively promotes external environmental events, collaborates with partner organizations, sponsors events, and serves on environmental advisory committees.

Annual Reporting Requirements

1. Outreach Events

The City has a strong commitment to honoring the public involvement permit requirement and increasing public participation in watershed events. The City fully commits to continue its regular involvement with both annual local "river clean-up" days - Clean Valley Day (spring) and Fall Waterways Cleanup (autumn). In addition to this, the City plans to co-host a clean-up event with Deschutes Brewery on an annual basis. The City also implements programs for public involvement such as the Train-the-Trainer Rainbarrel Program and the Roanoke Riverkeeper program. The City also has active seats on the boards of the VAMSA, CVC, URRR, and Earth Fare.

Lastly, the City will have a presence, either with its own employees or through the City's public education and involvement contractor (Clean Valley Council), at many applicable local and/or regional events intended to make the public aware of stormwater and broader environmental stewardship issues and topics. Examples include but are not limited to: Earth Day celebration, Household Hazardous Waste and Electronic Waste collection events, various neighborhood group and other civic organization meetings and events, as well as maintain its membership on local and regional watershed planning and coordination committees. Otherwise, the City engages businesses, citizen groups, and the general public to participate in related events, and regularly takes steps to market and otherwise support such events.

Event / Program	City Participation	Implementation Schedule	Documentation & Effectiveness
Adopt-A-Stream	Program promotion in newsletter and social media, as well as posting about specific group clean up events.	Ongoing	Record number of events/ participant estimation / year.

Clean Up Events	•Program promotion in newsletter and social media •After event media follow up •City planning and co-sponsorship of Deschutes River Clean up	•Clean Valley Day	Teams - 68 Attendees – 1053
		•Deschutes River Cleanup	100+
		•Fall Waterways	Teams - 43 Attendees – 698
Festivals/Outreach Events/ Presentations	•Program promotion in newsletter and social media. •Event sponsorship and/or vendor participation	Ongoing see section attachments for list of outreach events	69,058+
Roanoke Riverkeepers	•Program promotion in newsletter and social media. •Event sponsorship	Ongoing	16
Bacteria Monitoring	City planning and sponsorship of Bacteria Monitoring.	Ongoing	Developing
Train the Trainer Rainbarrel Program	•Program promotion in newsletter and social media. •Event sponsorship and/or vendor participation	Ongoing	15 Civic Groups
Stormdrain Stenciling Program	•Program promotion in newsletter and social media. •Event sponsorship and/or vendor participation	Ongoing	55 Marked 77 Volunteers
Stream School Seminars (CVC)	•Program promotion in newsletter and social media. •Event sponsorship and/or vendor participation	Ongoing	15 Programs 466 Youth, 237 Adults
Stormwater Educational Programs (CVC)		Ongoing	23 Programs 268 Youth, 50 Adults
Household Hazardous Waste Collection Program	•Program promotion in newsletter and social media.	Ongoing – every third Saturday of the month.	See section attachments.
Drug Take Back Event Program	•Program promotion in newsletter and social media.	Ongoing – twice a year.	Record number of events/ participant estimation / twice a year.

Local and Regional Stormwater Management Planning	•Program promotion in newsletter and social media. •Event sponsorship and/or vendor participation	Ongoing	See section attachments.

MCM#2 Public Involvement and Participation

Supporting Documents:

- City of Roanoke Stormwater Division Public Involvement and Participation FY 2016-2017
- Household Hazardous Waste Summary FY 2016-2017
- CVC Programs and Events FY 2016-2017
- RVARC Local and Regional Stormwater FY 2016-2017
- VAMSA Member Meeting Agendas FY2016-2017

MCM #3: Illicit Discharge Detection and Elimination

Christopher Blakeman, Environmental Administrator (540) 853.1173

Description

The City's IDDE Ordinance establishes the MS4 program authority and requirements for illicit discharge detection and elimination compliance with the MS4 and VPDES permits. Implementation of outfall screening standard operating procedures (SOPs) and illicit discharge (SOPs) will provide a clear direction for response and enforcement of the IDDE Ordinance. The City promotes the public's reporting ability and this is further outlined in the Program Plan and the Sediment and Bacteria TMDL Action Plan.

Annual Reporting Requirements

1. Outfall Screening

The accompanying spreadsheet shows the results of our outfall surveys for the reporting year. These have been sorted to separate those where flow was found and where further investigation or referral was necessary.

2. Illicit Discharge Investigations

The accompanying spreadsheet provides a listing of all illicit discharge investigations that were performed during the permit year. While all such investigations are taken seriously, three incidents that involved significant direct discharges and are therefore of particular interest include Stormwater Pollution Compliant Numbers (SWPC#) 17-001, 17-002 and 17-007. These are summarized here:

- 17-001 – A storm drain inlet within a dumpster enclosure at the Valley View Mall was being used to dispose of wastewater with solids contamination by employees of the Chick-Fil-A restaurant. City and Mall staff coordinated with a response contractor and the restaurant to have the inlet and downgradient pipes cleaned and to re-educate applicable staff.

- 17-002 – Complaint was received about a milky white substance in Crystal Springs Creek near Carilion Hospital, but initial investigation by city staff did not reveal a likely source and the contamination dissipated and did not return. City staff left word with the hospital and asked to be promptly notified if conditions were observed again. Identical report was received 2 and 3 days later in the early morning hours. More detailed investigations with hospital management staff identified the source as housekeeping staff dumping mop and other wastewater into gutter drains at the facility's shipping dock. Hospital implemented clean-up and retraining measures, and invited city personnel to re-inspect.

- 17-007 – Complaint received about a white milky substance in Lick Run near a downtown area outfall. Investigation by city staff identified the contamination is very likely sanitary waste water and notified the DEQ. City staff also reported the concern to the WVWA who investigated and confirmed the presence of an upgradient sanitary sewer leak and cross connection with the stormwater drainage system. WVWA crews repaired the leak and cross connection over the subsequent days.

Outfall Mapping - MS4 Program Plan Update

The City has developed and maintained a robust GIS map of our MS4 for over a decade and is available online to the public on the City's Real Estate GIS (http://gisre.roanokeva.gov/js/). The system is continually updated using as-built drawings for new construction, as well revisions and amendments based on watershed asset inventories, and other field reconnaissance and investigative findings.

Responsibility for the operation and maintenance of the Stormwater GIS map rests with the Stormwater Division GIS technician and with data collected by the CCTV field crews in the Maintenance Department. The Stormwater Division, in cooperation with the City's Information Technology Division maintains the data.

In the spring of 2015 our Stormwater Division began a collaborative project with the Virginia Tech Dept. of Civil and Environmental Engineering to develop and implement a plan for revising our MS4 GIS map to accurately reflect the true drainage basin area of our storm pipe network. Using field GPS collection, coupled with real time field surveys and CCTV camera investigations, we are updating the MS4 asset inventory to ensure that we meet all of the requirements of this permit section.

Asset inventories have been completed for Lick Run (FY15); Tinker Creek, Carvin Creek and Glade Creek (FY16); and Trout Run (FY17). Peters Creek is planned for FY18.

During FY 17, all outfalls in the city were assessed for whether they met the criteria of a regulated outfall and updates throughout the city were made. Catchments were delineated during the summer of 2016 and drainage areas are now available for associated outfalls.

The City requested and received GIS outfall data from VDOT to further assess MS4 regulated outfalls within the City's jurisdictional boundary. Discrepancies have been identified that may need further review and communication with VDOT to determine responsibility.

The City has prepared an online map detailing the stormdrain system, outfalls, and catchment areas. Outfalls may be selected via computer mouse click which then displays the highlighted boundary of the corresponding total drainage area on the map. A legend is present to communicate the various layer details associated with the map. An information table includes stormdrain system infrastructure types, outfall identification number, receiving waters, impairments along with the associated TMDL, HUC, and drainage areas and acreage is available as well. This map will be available online and in paper format at citizen request.

Please note: Trout Run is conveyed under downtown Roanoke in two box culverts running parallel to Norfolk Ave and Campbell Ave. The City has accurately reflected the underground outfall locations in this central business section. Also correctly included as outfalls, are pipes containing roof runoff. The logistics of creating drainage areas in this section would produce an unusable product. Since the goal of this exercise is to assist the City in tracking illicit discharges, the City has chosen to create drainage areas as if the box culverts only conveyed stormwater which then empties into the concrete channel conveying Lick Run.

MCM#3 Illicit Discharge Detection and Elimination

Supporting Documents:

- Outfall Screening
- Illicit Discharge Investigations
- Outfall Map Link included in Outfall Map Usage Directions
- Complete Outfall Table as PDF

MCM #4: Construction Site Stormwater Runoff Control

George Nevergold, Development Review Coordinator (540) 853.6501

Description

Chapter 16 of the City of Roanoke's Design Manual sets forth guidance on inspection procedures.

Annual Reporting Requirements

1. **Land Disturbing Permits/Acres Disturbed**

A total of 28 land disturbance permits were issued for this past fiscal year with the total disturbed acreage of 39.55 acres. A record of all permitted land disturbance activities detailing the land disturbance permit #, site address, description, issued date, current status, owner name, applicant name, latitude & longitude and acreage disturbed has been included in the PDF file labeled: 'MCM4 Reports FY16_17'.

2. **Inspections Completed**

A total of 1705 Erosion and Sediment Control (ESC) Inspections were conducted this past fiscal year. Of those 1705 inspections, 858 of them were rain event inspections; 413 were weekly and biweekly ESC inspections; 24 were initial ESC inspections; 158 were SWPPP inspections; 158 were pollution prevention inspections. A report detailing permit number, address and number of inspections per permit has been included in the PDF file labeled: MCM4 Reports FY16_17.

Additionally, 94 ESC inspections were conducted for Single Family Residences (noted as initial ESC inspections and weekly and biweekly ESC inspections.)

3. **Enforcement Actions**

Generally verbal notifications of ESC and SWPPP violations are used as a first measure. If the City finds this is not enough, we move to a formal Notices to Comply and if necessary Stop Work Orders. Additionally the City issues Stop Work orders for any land disturbance that occurs without an approved plan. The recent MS4 audit by the local DEQ representatives has indicated that the City should record and track all verbal requests to comply as part of the history of violations and responses in the future.

The City issued 1 full Stop Work Order and 3 Partial Stop Work Orders this past fiscal year. One was for initiating grading work without an approved erosion and sediment control plan or land disturbance permit and three were for infractions of existing land disturbance permits.

The City is working to update the MS4 Program Plan with written procedures for ESC plan review process and procedures, what documents are utilized in ESC plan review, written ESC inspection procedures and associated documents, and inspection schedules, and written procedures for compliance and enforcement.

MCM#4 Construction Site Stormwater Runoff Control

Supporting Documents:

MCM4 Reports FY16_17:

- FY16_17 New Land Disturbing Permits
- FY16_17 ECS Initial Inspections
- FY16_17 ESC weekly and Bi-Weekly Inspections
- FY16_17 Rain Event Inspections
- FY16_17 Single Family Residence ESC Initial Inspections
- FY16_17 Single Family Residence ESC Weekly and Bi-Weekly Inspections
- FY16_17 ECS SWPPP Inspections
- FY16_17 ECS Pollution Prevention Inspections

MCM #5: Post Construction Stormwater Management

George Nevergold, Development Review Coordinator (540) 853.6501

Description

Initial Design and long term maintenance of stormwater management facilities is guided by the Stormwater Design Manual. Chapter 15 covers the maintenance requirement of BMPs and Chapter 16 outlines enforcement.

Annual Reporting Requirements

1. **Public BMPs**

Attached and labeled, Private_Public Combined BMPs, is a map that details the locations of all publically and privately owned BMPs within the City of Roanoke. The following pages contain a table combining all BMPs. The tracking and management of these two types of BMPs is handled differently between the Planning Department, who manages the privately owned BMPs and the Stormwater Division, who manages the publically owned BMPs. Integration of management will be a process over time.

2. **Public BMP Inspection Report**

Attached you will find a DEQ certificate that certifies Stormwater Engineer, Joseph July to inspect the publically owned BMPs. A PDF is included in the attachments section that outlines the public inspection report. As noted in the Program Plan, the City is using a GIS-based iPad app to conduct these BMP inspections. As part of the app, repair material quantities have already been specified. A spreadsheet containing the BMP information, including material quantities as well as the BMP Inspection Report will be sent to Stormwater Field Operations for resolution. Written procedures for this process are located in the Program Plan.

3. **2017 New Private BMPs**

The City has a process for acceptance of newly constructed BMPs, as well as BMP's that were constructed prior to the current regulations and records management. Attached is a PDF file labeled MCM5 Reports FY16_17 which indicates the BMPs that were accepted this past fiscal year (see page 15).

4. **2017 Privately Owned BMP Data**

Existing BMPs within the City of Roanoke are tracked. With the new permitting software, City personnel are moving through a learning curve to get up to speed with the system. This reporting process has identified several shortcomings in our reporting; however measures are being taken to create future reports with more accuracy and ease. Information gaps are consistently being identified and corrected. Newly identified BMPs are being included in the database, both newly constructed and from development that are years old but have not been adequately maintained. The City Attorney's office has developed a SWM Maintenance Agreement for 'existing' facilities which have just been identified.

The City has been actively engaged in the process of "filing in the data gaps" for public and private BMPs. The BMP drainage areas, pervious and impervious, require old file research and discovery and cannot be handled by the skill set of an office temp person; therefore, staff with plan review skills and engineering knowledge must be utilized.

The City is making diligent progress but still have many data gaps to resolve. New procedures have been implemented to obtain the required BMP information on all completed comprehensive development projects during the gathering of as-built storm drain and SWM BMP data.

See the attached PDF named, MCM5 Reports FY16_17, (pages 1-7) which contains information on the City's BMPs, including their location, relevant dates, engineering data and other associated information.

5. 2017 Privately Owned BMP Inspections

The City inspection program for privately owned BMPs has 3 certified inspectors who conduct and record their inspection results in the City's new tracking software. Inspections are conducted yearly on all BMP measures and, should an inspection fail, the property owners are given an opportunity to correct whatever shortcomings were found. Re-inspections are scheduled giving ample time for owner actions. A total of 432 inspections were performed on existing stormwater management facilities (BMPs) within the City of Roanoke for this past fiscal year. A report detailing the permit number and location has been included in the attached PDF file labeled: MCM5 Reports FY16_17, (pages 8-13).

6. 2017 Privately Owned BMP Violations

This fiscal year a total of 73 notices of violation were issued for lack of maintenance, either by way of inspection report or formal certified letter. A report is attached detailing the locations and associated permits where violations were noted and corrected. The City continues to send notification of the pending annual inspection to all property owners. Ample time is given to allow the property owners to review their facilities needs and have them corrected prior to the scheduled inspection.

Inspections by Certified City staff are entered into the City's tracking software and rescheduled for an appropriate time in the future to allow a property owner to correct the cited situations. If the follow-up inspection can be entered as a "PASSED" inspection the property owner is notified; otherwise a second notification is sent and another inspection is scheduled. This process is followed until the site is brought back into compliance. City staff is available to meet with owners and assist them in the understanding of what has gone awry and how to make the necessary corrections. A report detailing the BMP violations has been included in the attached PDF file labeled: MCM5 Reports FY16_17, (page 14).

MCM#5 Post Construction Stormwater Management

Supporting Documents:

- Public BMPs
- Public BMP Inspection Report

MCM5 Reports FY16_17

- FY16_17 Listing of All Private BMPs
- FY16_17 Private BMP Inspection Report
- FY16_17 Private BMP Violations Report
- FY16_17 New Private BMPs Accepted

MCM #6: Pollution Prevention/Good Housekeeping for Municipal Operations

Responsible Staff / Position: Leigh Anne Weitzenfeld, Water Quality Administrator (540) 853.5910
Christopher Blakeman, Environmental Administrator (540) 853.1173

Description

This section includes measures, procedures, and processes that have been taken to ensure the City is in compliance for implementing pollution prevention and good housekeeping measures as the staff conducts daily work.

Annual Reporting Requirements

1. **Development and Implementation of Daily Operational Procedures**

A detailed series of operationally specific Standard Operating Procedures (SOPs) have been developed and implemented for all activities and operations deemed to present a potential or real threat of pollution and these have been periodically updated and revised to reflect facility and operational changes. These SOPs can be found in the City's 2017 Program Plan Revision.

One SOP for the Solid Waste Ready Line will be amended to include monthly inspection of the drop inlet and quarterly extraction of contents or as needed due to heavy rainfall with the vactor truck as a result of the MS4 Audit, held in June 2017. Multiple layers of inlet protection have been added.

Street Sweeping Performance

In the past permit year, the City streetsweeping crews cleaned an estimated total of 13,917 lane miles. Those lane miles are spread between residential, arterial, and "central business district" streets, which are swept with correspondingly increased frequency. These operations removed 1,444.84 tons of debris from the streets, thereby preventing it from getting into the stormdrain system.

Stormdrain System Maintenance

A total of 4208 stormdrains, of the 10,033 city-wide, were inspected during the last permit year, resulting in 177 being cleaned and 52 being repaired. This represents an inspection increase of 702 from the previous fiscal year. Annual tonnage removed by Vactor trucks from the stormdrain system is 180 tons, calculated by Resource Authority weight tickets. Included in the attachment section is a spreadsheet detailing the location of each inlet and the maintenance activities that have been completed.

Mutt Mitt Program

The City has a total of 90 Mutt Mitt Stations under the management of the Parks and Recreation Department and the Stormwater Division. In FY 2017, 56 educational signs were designed by the Stormwater Division and purchased with grant money donated by the Mill Mountain Garden Club. Sign Installation is planned for FY 2018. Additional Mutt Mitt Stations will be added as needed on publically owned properties.

Roanoke City Public School (RCPS) Good Housekeeping BMPs

RCPSs have instituted a set of BMPs to guide their school staff through good housekeeping practices. RCPS building maintenance staff conducts monthly inlet checks for their school facilities that have a stormdrain system. These BMPs also include checking dumpsters and other waste storage areas. Work orders are created if inlets are not found to be clear of debris and trash and other problems are found onsite. These BMPs and inspection sheets have been included in this report. In addition, all Roanoke City School parking lots are swept twice a year.

2. Stormwater Pollution Prevention Plans

The City's PWSC and Dog Park Stormwater Pollution Prevention Plans were completed and became effective July 1, 2017. Revisions will be undertaken as necessary in response to 2017 Audit Feedback and as part of an iterative adaptive process as the document is implemented.

Roanoke City Public Schools will be developing a SWPPP for the Patrick Henry High School Auto Shop in FY2017-2018. The RCPS's Transportation Facility has its own VPDES permit. It currently has an SPCC and clarification is being obtained on whether a SWPPP already exists for this Roanoke City Public School Property. If a SWPPP does not exist, one will be created during FY2017- 2018.

3. Turf and Landscape Nutrient Management Plans

In FY2016, Nutrient Management Plans (NMPs) were completed for River's Edge South (~3 acres), Mountain View (3.5 acres) and Elmwood Park (3.4 acres). This concludes the properties managed by the City of Roanoke that require NMPs.

The City of Roanoke continues to assist and advise the Roanoke City Public Schools on development of their NMPs and those should be completed in FY2018. In-house RCPS grounds crews will be collecting soil samples to send to Virginia Tech Extension for analysis. A meeting with Mr. Coker, of Coker Consulting, who created the NMPs for City properties, will be set to discuss the NMPs once the soil sampling results are received. The five sites identified as needing NMPs are: Patrick Henry High School, 10.1 acres; William Fleming High School, 12.9 acres; James Madison School, 1.88 acres; Fishburn Park Elementary School, 1.36 acres; and Lucy Addison Middle School, 1.4 acres.

4. Employee Training

The City is committed to training all applicable personnel in accordance with Section II.B.6.d. of the permit. The City has designed a training program to ensure conformance with this requirement, as well as to ensure all employees, regardless of their job duties, receive stormwater pollution awareness training at a basic level.

Additionally, the City of Roanoke continues to provide Environmental Awareness Training as part of its orientation for new employees. Included in this training is a section with a heavy emphasis on stormwater pollution prevention, which helps trainees to understand the impact stormwater pollution can have on our community and provides guidance on how to report real or suspect stormwater pollution issues. For the FY 16-17, 215 new employees received this training on the following dates: 8/18/16, 10/5/16, 11/17/16, 12/7/16, 1/5/17, 3/16/17, 5/17/17, and 6/6/17.

The City has compiled a list of all employees (identified by job titles and/or responsibilities) that will need to receive the specified training under Section II.B.6.d. of the permit. As per Section II,B,6,d, the employee stormwater training plan developed and submitted for FY17 was carried out. For FY2018, the Stormwater Division

plans to assist PWSC Departments with SWPPP training as needed. Additionally, PCB training is planned for FY2018. The next Stormwater Pollution Prevention/Illicit Discharge is pending the new MS4 Permit for the cycle 2019-2023.

RCPS have also begun their building manager and staff training program. This includes a stormwater presentation along with specific spill kit training. The City has begun dialogue to be able to share our stormwater video series license so that relevant staff can view the Excal MS4 RAINcheck and IDDE videos that the City uses for training. This would be applicable for RCPS building maintenance and transportation-based staff. General Stormwater training could be implemented for all other RCPS staff as proper audiences are identified.

5. MS4 Program Review and Evaluation

With the dedicated efforts of the Stormwater Utility, the City continues to make great strides in creating a more cohesive program. As Watershed Master Plans are created for each Roanoke River tributary, the City is integrating the following goals into the TMDL Action plans, in particular the Bacteria and Sediment TMDL Action Plan.

- **Maximize watershed resiliency and sustainability** which will reduce flooding, in-stream erosion, sediment loads, and bacteria loads while increasing base flow in dry channels, biological life, recreation, and aesthetics.
- **Minimize watershed hazard to public health, safety, and property** which will reduce flooding, flood insurance costs, flood repair costs, in-stream erosion, sediment loads, and bacteria loads while increasing base flow in dry channels, biological life, recreation, and aesthetics.
- **Connect citizens, businesses, students, and other stakeholders to their watershed** which will reduce illicit discharges while increasing property values, treatment from private BMPs, community education, watershed knowledge base, recreation, and aesthetics.

Incorporating these goals and their associated action items and indicators will help to create a performance measuring metric that will help track progress. Our water quality monitoring programs will allow the City to track progress over time.

In collaboration with our contractor, Clean Valley Council, the City has met and exceeded the MS4 requirements for outreach, education and public involvement. Developing programs, which are outlined in more detail in the Program Plan and Action Plans, will help to further educate and engage citizens in being active participants in optimizing the health of their watersheds.

Stormwater's continued asset inventory and CCTV activities will provide greater capabilities to track illicit discharges and identify problems. IPad field data entry and a dedicated GIS staff member also increase efficiency and error reduction.

Areas for improvement will be focused on integrating the above goals into daily actionable items.

MCM#6 Pollution Prevention/Good Housekeeping for Municipal Operations

Supporting Documents:

- City of Roanoke Training Records
- RCPS Training Content and Records
- FY2017 Stormdrain Maintenance Locations
- FY2017 Mutt Mitt Program Updates – Mutt Mitt Signage
- City of Roanoke Dog Park Inspection Reports FY 16-17
- Stormwater Service Requests Generated by iRoanoke FY 16-17